

IN THE DESCRIPTION

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The laser source illustrated in Figure 2 is based on a loop mirror formed by a 3-dB (first) fiber coupler 10 having four, ports A, B, C and D, and a loop of active fiber 12, preferably erbium-doped, with its ends connected to ports C and D, respectively, through wavelength-selective couplers 14 and 16 that are also connected to pump sources (lasers) 18 and 20, respectively. The laser source in Figure 2 differs from that shown in Figure 1 in that the FBGs are not connected in series to the port A of fiber coupler 10 but are instead connected in parallel. Thus, FBGs 22A and 22B are connected to ports A and B of a second 3-dB coupler 30 by way of attenuators 32A and 32B, respectively. FBGs 24A and 24B are connected to ports A and B of a third 3-dB coupler 40 by way of attenuators 34A 36A and 34B 36B, respectively. The transmissive ports of FBGs 22A, 22B, 24A, and 24B are coupled to four output ports P1_{OUT}, P2_{OUT}, P3_{OUT} and P4_{OUT}, respectively. Ports D of couplers 30 and 40 are connected to ports A and B, respectively, of the 3-dB coupler 10, and ports C of couplers 30 and 40 are connected to fifth and sixth output ports P5_{OUT} and P6_{OUT}, respectively.

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The attenuators 32A, 32B, 34A 36A and 34B 36B allow the amplitude of the light at each wavelength to be adjusted so that, if desired, they are equal.

Although, in the above-described laser sources, the gratings each reflect about 50 per cent of the selected wavelength light, other proportions could be used.

It is an advantage of the present invention that a multiplicity of wavelengths can be provided using a single active-fiber loop mirror and a grating for each wavelength. Also, the number of wavelengths can be increased simply by adding more fiber gratings, and perhaps increasing pump energy, as appropriate.